Civil Works Administration Emergency Relief Administration Malaria Control Program in the South*

LOUIS L. WILLIAMS, JR., M.D.
Surgeon, U. S. Public Health Service, Washington, D. C.

IN the spring of 1933 the Federal Emergency Relief Administration was organized. Some of the state health departments immediately utilized relief labor on their malaria control projects. In October the Civil Works Administration was organized and announced that it was searching for worthy projects on which CWA laborers might be given gainful employment. The Public Health Service submitted to them a program for antimalaria drainage. This was enthusiastically incorporated in the CWA program and an organization for its administration was set up in November, actual work commencing in December, 1933.

On such short notice it was not possible to organize technical supervisory forces in 14 states, from resources within the state health departments, with which to direct the large number of laborers who must be put to work quickly. The Public Health Service was asked to supply this technical supervision for the drainage work and was given $350,000 of PWA funds through the CWA.

The organization within each state consisted of a state director of malaria control to assist the state health officer; district supervisors, whose number was based upon expected federal allotment of labor; and local supervisors. The federal allotment was greatly augmented, as nearly every state far exceeded the federal quota of drainage laborers. The assistant state directors and the district supervisors, working with and under the state boards of health, made surveys as rapidly as possible in order to find the most worthwhile projects; secured approval of projects; trained local foremen; received the labor and put it to work.

State records defining the malarious areas of each state, physicians' reports, hearsay evidence, and population densities, have defined the limits of each project. As was to be expected, there were frequent requests from influential landowners who sought free drainage where no particular malaria problem was involved. Fortunately, these were for the most part detected, and failed to get approval.

There were, in spite of the hurriedness of the entire relief organization, 14 assistant state directors with their 59 district supervisors, and 212 local supervisors, at work before the end of December. For nearly 4 months they supervised an average of 64,000 workers, the peak week accounting for 120,000 laborers. Nearly 6,000 miles of ditch were dug, draining 100,000 acres

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of pond and more than 200,000 acres of swamp, affecting an adjacent population estimated at 8,000,000 persons. As it was not known how long relief labor would be available, state and district supervisors were urged to secure a promise from local authorities that necessary maintenance would be financed should the relief be suddenly withdrawn. In addition, educational campaigns for the purpose of popularizing the work were initiated to insure its future maintenance. CWA work is at present being maintained in most instances, and probably will be as long as relief labor is forthcoming.

The CWA came to an abrupt close at the end of March, 1934; so the malaria control project was continued under the Emergency Relief Administration. The immediate change in policy stopped most of the drainage work and a number of weeks passed before its continuance was assured under the various state relief administrations. Before the end of May most of the states were continuing the work.

Under the ERA there were 15 assistant state directors with the number of district supervisors reduced to 50, and only 7 local supervisors. However, this policy change from a work project to a relief project with its slower growth led to better planning of each project and, in the main, work was better done than under the hurried CWA. To date nearly all CWA projects have been completed and most of the remainder will be finished before the end of December, 1934. This does not apply to a few very large projects which have been undertaken on the theory that relief labor (certainly in some places) will be available for 2, 3, or 4 years more. During the last 6 months of the Emergency Relief operations, approximately 2,000 miles of additional ditch have been dug, draining over 16,000 acres of ponds and somewhat more than 30,000 acres of swamp, affecting an adjacent population of 2,000,000 persons. In places where drainage is not at present feasible some home screening projects have been undertaken. In a number of cases definite contract has been secured from local administrations that maintenance work will be locally financed when relief labor is no longer available.

The trend of malaria in the United States has been steadily downward for 70 or more years. The actual decline has fluctuated to some extent. The periodicity of its fluctuation, however, could not be accurately worked out, for usable records were not kept prior to 20 years ago. The records of the last 14 years show that the falling rate curve flattened out about 1919 with somewhat of a rise in 1920 and 1921, and then a resumption of the decline. The curve flattened out again in 1926 and showed a definite rise in 1927 and 1928, subsequently falling as before. The curve flattened out in 1932 and rose a little in 1933, and indications are that during the summer season of 1934 there has been a very sharp rise.

The decline in the malaria rate has been accompanied by a recession of the northern limit of the malaria territory; and also has shown a lessening of the virulence of the disease. Each rise in the rate has been accompanied by a reinvasion of a small portion of territory formerly malarious; by an increase in the virulence; and by local epidemics. The rise of 1934 indicates a rate higher than any during the last 20 years, for one or more definite epidemics of malaria have appeared during the fall in 7 states, 3 of which are states that have been at the northern limits of endemic malaria, and 1 of which has been entirely out of the malaria column for over 10 years. Also, the northern limit of malarious territory has moved north many miles and the virulence of the disease is greater than it has been for over 20 years. It is a matter of considerable interest and significance that the reports

so far available indicate that the increases in malaria have not occurred where Emergency Relief projects have been completed. It is not difficult to imagine the situation had not the hazard of malaria been removed from the bulk of the 10,000,000 people adjacent to these projects.

I do not mean to paint an ideal picture of perfect work perfectly carried out. Many projects during their inception were improperly planned by supervisors of limited experience and some even were constructed where work was unnecessary. Here and there ditches appeared that were almost impossible to maintain. However, most of these errors were corrected, and those few remaining are on the program for proper reconstruction. The estimates of our most experienced men in the field who have visited a large number of projects indicate that at least 90 per cent of the work has been good work and that, at a maximum, not over 10 per cent can be classed as poor. Lack of maintenance has created some new impoundings where loops of old streams, left open, have filled with backwater, or where uprooted trees have clogged main ditches. Some winter-dug ditches constructed by untrained personnel have very wide, flat bottoms. During the summer there has been insufficient water to maintain a continuous flow so ponds have appeared in territory hitherto lacking in ponds. Here and there, particularly in the earlier ditching, there are large spoil banks too close to the edge of the ditches. Occasionally there can be found a ditch, through a swamp, with no laterals tapping deeper pools near the outer edges. These very errors were in themselves educational. The engineers and foremen, observing the operation of the poorly constructed ditches, seldom repeated the errors. These experiences have not only educated supervisors, engineers, and foremen, but also thousands of laborers throughout the South. This, in addition to the educational program, has gone a long way toward teaching the bulk of the population in the malarious areas to recognize good drainage and presages future control.

In addition to the drainage projects a blood index was taken to determine the endemic rate of malaria in the 15 states. To date, 129,000 slides have been examined. Unfortunately, the slides could be taken only while the CWA was in force and therefore were secured only in the winter and very early spring. At that part of the year the reservoir of malaria is at its lowest. The 129,000 slides show an infection rate of 5.8 per cent. This is divided into nearly 60 per cent benign tertian and 40 per cent estivo autumnal. There is a scattering of quartan—less than half of 1 per cent. In one state an in-

BLOOD INDEX—MARCH THROUGH MAY, 1934 *

State	No. Exam.	No. Pos.	% Pos.	B. T.	% B. T.	E. A.	% E. A.	Quar.	% Quar.	Mix.	% Mix.	Un-det.	% Un-det.
Arkansas	9,607	686	4.7	361	61.6	302	37.8	..	...	23	0.5	..	...
Florida	13,384	679	5.1	188	27.6	491	72.3	..	...	..	...	..	...
Georgia	27,005	1,136	4.2	632	55.7	423	37.2	29	2.6	6	0.5	46	4.0
Kentucky	4,794	344	7.2	105	30.5	237	68.9	..	...	2	0.58	..	...
Louisiana	9,377	600	6.4	321	53.5	270	45.0	1	0.16	8	1.3	..	...
Mississippi	19,172	1,156	6.0	590	51.0	551	47.7	2	0.18	13	1.1	..	...
Missouri	4,452	397	8.9	207	52.2	180	45.3	..	...	10	2.5	..	...
New Mexico	4,230	53	1.3	47	88.7	6	11.3	..	...	..	...	..	...
North Carolina	8,357	124	1.5	52	41.9	71	57.2	..	...	1	0.8	..	...
South Carolina	3,141	198	6.5	76	38.4	116	58.5	3	1.5	3	1.5	..	...
Texas	22,643	2,221	9.8	1,949	87.7	267	11.1	..	...	5	0.22	..	...
Virginia	2,770	11	0.39	11	100.0	....	....	..	...	..	...	..	...
Total	128,932	7,605	5.8	4,539	59.7	2,914	38.3	35	0.46	71	0.93	46	0.6

* Index report only of number of slides examined through October, 1934. Over 50,000 stained slides yet to be examined.

dex in the summer shows an infection rate among adults of 10 per cent. A number of localities experiencing severe malaria outbreaks recently have shown rates from 50 to 65 per cent. In our former studies fall rates of 18 per cent to 26 per cent have not been at all unusual. A number of such areas on recent resurvey have exceeded 30 per cent. The 10,000,000 persons adjacent to drainage projects were known to harbor malaria parasites at the rate of 5.8 per cent during the winter—what the rate would have been this fall without the control work it is impossible to say, but a conservative estimate places it at not less than three times that figure. At least one can say that the benefits have been considerable.

If the present program can continue, the ultimate benefits to the South are incalculable. Maintenance of the work and extension into new territory is assured as long as ERA labor is available and is provided with adequate supervision. The Public Health Service has nearly exhausted the fund allocated to it for supervision, so if direction through the State Boards of Health is not forthcoming we may confidently expect to see ERA labor placed on other projects. The immediate concern of each southern state health department is to devise at once a workable plan that will assure continuation of expert supervision.

Effects of Depression on the Vision of Children

SCANT attention has been given in this country to the manifestations of disease of the eyes following long periods of dietary insufficiency and imbalance in a large group of our populace during the present depression. It has been assumed that though these diseases may be found in China, and were to be found in Germany during the war, this country has escaped them during the present depression.

Unfortunately, as a result of the long depression and consequently poverty, these diseases are beginning to appear in this country. Totally inadequate or imbalanced diets of the unemployed are beginning to exact their toll. Among the children of New York City, particularly in certain sections of the community, I have noted increasing incidence of pathology of the eye of this nature.

Disease of the eye due to diets deficient in vitamin A content is becoming far less rare than it used to be considered; I was almost impelled to say, are becoming fairly common. Xerophthalmia of a mild form and hemeralopia (day-blindness) are not at all uncommon. I have noted that in quite a number of children proper refractive correction failed to give a satisfactory improvement of vision, in the absence of gross pathology; that vision findings with the same correction were better on dull and cloudy days than on bright, sunny days; and finally that placing these children in a dark room for 10 minutes to a half an hour resulted in a sharp rise in vision, and exposure to bright light caused a rapid drop in visual acuity. These cases rapidly respond to vitamin A therapy in the form of carital, cod-liver oil, and a diet incorporating raw carrots, with a sharp rise in vision. Some of the more long-standing cases, however, present corneal changes which are less promising in prognosis for vision. Pigmentary changes are especially prominent in negro children. . . . E. M. Josephson, M.D. *The Eye, Ear, Nose and Throat Monthly,* Dec., 1934.